

# Obesity as a Determinant of Two Forms of Bullying in Ontario Youth: A Short Report

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## Keywords

Behavior · Childhood obesity · Obesity · Overweight · Social determinants · Physical bullying · Relational bullying · Violence

## Summary

**Objective:** Obesity can have negative effects in terms of stigma and discriminatory behavior. Past cross-sectional analyses have shown that overweight and obese youths are more likely to be involved in bullying. Here, we examine such relationships in a longitudinal analysis. Study outcomes were self-reports of: i) physical bullying victimization and perpetration and ii) relational bullying victimization and perpetration. **Methods:** Participants were administered the Health Behaviour in School-Age Children Survey in 2006 and then again in 2007, and included 1,738 youths from 17 Ontario high schools. Relationships between adiposity and each of the four forms of bullying were evaluated using multi-level analyses.

**Results:** Excess adiposity was shown to precede bullying involvement in this study. Obese and overweight males reported 2-fold increases in both physical and relational victimization, while obese females reported 3-fold increases in perpetration of relational bullying. Among those free of bullying at baseline (2006), significant increases in perpetration of relational bullying were reported by obese females in 2007 relative to normal-weight females (14.8 vs. 3.8% among normal-weight girls;  $p = 0.02$ ). **Conclusions:** Findings are congruent with previous cross-sectional studies and confirm that obese youths are at increased risk of social consequences attributable to their appearance.

## Introduction

Interpersonal violence is a contemporary adolescent health problem, and novel research is required to examine its determinants. Antisocial behaviors can be established as early as pre-adolescence or even preschool, and may manifest in various forms of bullying. Bullying is a common problem in the Canadian school system; of particular concern are physical and relational forms of bullying due to their high prevalence among males and females [1].

The physical appearance of children is one of many possible determinants of bullying experiences [1]. An individual's appearance affects how others react and respond to them in social contexts. Internalization of these behaviors could then lead to perpetration of bullying [2]. Analogously, the 'Obesity Stigma Approach' suggests that weight-based stigma places overweight and obese youths at risk of anti-social health outcomes; these findings have been supported by past cross-sectional analyses [1].

We explored the temporal sequence between adiposity status and reports of bullying in a sample of high school students. Based upon prior cross-sectional research [1], we hypothesized that males who are obese at baseline would be more likely to become victims and perpetrators of physical bullying and that obese females would be more likely to be relationally victimized. In theory, increased adiposity would make obese youths targets for physical bullying; however, increased adiposity would also help those involved in physical bullying dominate their peers at key developmental stages of life, possibly leading to increased bullying perpetration. For relational bullying, increased adiposity status poses no advantage, but youths could still be victimized for not meeting physical ideals [2].

## Material and Methods

### Survey and Study Population

Health Behaviour in School-Aged Children (HBSC) is an international survey conducted in affiliation with the World Health Organization [3]. The 2006 Canadian HBSC involved 186 schools and 9,672 students [3]. The Queen's University Research Ethics Board approved the study. Consent was also sought from the school board and each individual school. The study used an active consent procedure for acquiring parental consent, in which parents or guardians were sent letters asking for consent. Finally, the child's consent to participate in the study was acquired. Approximately 74% of students in the sample participated, and only 10% of students declined to participate or spoiled the questionnaire. Other non-participants were students who failed to return the parental consent form, who did not receive parental consent, or who were absent on the day the survey was administered.

17 schools in Ontario agreed to a special follow-up study in 2007. Of these, 16 schools were surveyed again in 2007 (one withdrew due to a student death), making 2,031 students available for longitudinal analyses. The present study focused on these 2,031 students: 291 were further excluded based on missing height and weight data ( $n = 271$ ), no date of birth information ( $n = 15$ ), or implausible changes in heights or weights ( $n = 5$ ), leaving a final sample of 1,738 students (85.6%).

### Survey Methods

#### BMI and Obesity Classification

In order to calculate BMI ( $\text{kg}/\text{m}^2$ ), heights and weights were provided by self-report. Participating children were classified as normal weight, overweight or obese based on international cut-offs developed by Cole et al. [4].

#### Bullying

The HBSC bullying questions were developed originally by Solberg and Olweus [5] and have been shown to provide accurate estimates of prevalence. Children were asked questions about both perpetration and victimization of bullying behavior, with response categories ranging from: 'never' to 'greater than once a week'. As per existing precedents [5], bullying involvement was dichotomized (at least 2 or 3 times per month or not).

Two specific forms of bullying were investigated. Physical bullying perpetration was assessed through a single question: 'I hit, kicked, pushed, shoved around, or locked another student(s) indoors.' Two questions were asked about relational bullying perpetration: i) 'I have kept another student(s) out of things on purpose, excluded him or her from my group of friends, or completely ignored him or her,' and ii) 'I spread false rumours about another student(s) and tried to make others dislike him or her.' Affirmation of either or both of these relational bullying questions indicated relational bullying perpetration. Analogous questions were also used to assess victimization by the two forms of bullying for a total of four measures of bullying involvement.

#### Statistical Analyses

A repeated measures multi-level logistic regression model was employed to quantify associations between adiposity and bullying involvement. This was performed using SAS version 9.1.3 and the PROC GLIMMIX procedure (SAS Institute Inc., Cary, NC, USA). The multi-level model consisted of three levels: i) within students, ii) between students and iii) between schools, and simultaneously accounted for clustering at the school level. Potential confounders included screen time, age, a measure of self-esteem, and socioeconomic status (measured via family affluence score) which were selected based upon prior literature and backwards elimination processes.

A descriptive subanalysis was conducted among children who were free of the bullying outcome of interest at baseline. Incident cases of each type of bullying in 2007 were identified and compared with baseline adiposity levels; Fisher's Exact Test was used in these comparisons.

**Table 1.** Results of repeated measures multi-level logistic regression analyses examining adiposity as a risk factor for bullying

| Type of bullying | Adjusted risk ratio <sup>a</sup> |                           |                      |
|------------------|----------------------------------|---------------------------|----------------------|
|                  | normal weight<br>OR              | overweight<br>OR (95% CI) | obese<br>OR (95% CI) |
| <i>Males</i>     |                                  |                           |                      |
| Physical         |                                  |                           |                      |
| Victimization    | 1.00                             | 1.09 (0.56–2.10)          | 2.07 (0.85–5.02)     |
| Perpetration     | 1.00                             | 1.10 (0.61–2.00)          | 1.71 (0.70–4.18)     |
| Relational       |                                  |                           |                      |
| Victimization    | 1.00                             | 1.24 (0.72–2.14)          | 2.11 (0.95–4.70)     |
| Perpetration     | 1.00                             | 1.11 (0.63–1.96)          | 0.99 (0.35–2.75)     |
| <i>Females</i>   |                                  |                           |                      |
| Physical         |                                  |                           |                      |
| Victimization    | 1.00                             | 0.24 (0.03–1.80)          | 1.32 (0.28–6.24)     |
| Perpetration     | 1.00                             | 0.41 (0.05–3.20)          | 1.52 (0.17–13.3)     |
| Relational       |                                  |                           |                      |
| Victimization    | 1.00                             | 0.73 (0.40–1.32)          | 1.76 (0.77–4.03)     |
| Perpetration     | 1.00                             | 1.29 (0.58–2.86)          | 2.98 (1.03–8.61)     |

<sup>a</sup>Adjusted risk ratios control for screen time, age, self-esteem and family affluence score.

## Results

Among males, approximately 2-fold increases in the odds of bullying involvement were observed among obese participants for both physical victimization and perpetration, though neither of these represented significant increases ( $p > 0.10$ ). A similar effect was observed for the odds of relational victimization among males ( $p = 0.07$ ). Overweight and obese females reported 1.29 (0.58–2.86) ( $p = 0.53$ ) and 2.98 (1.03–8.61) ( $p = 0.04$ ) times the relative odds of relational bullying perpetration respectively, and this trend approached significance ( $p = 0.06$ ). No other statistically significant trends were identified among females (table 1).

Among males who did not engage in bullying at baseline (2006), no statistically significant increases in the incidence of perpetration or victimization (any type) were observed by BMI class. Among females, significant differences were found for relational perpetration, with higher levels reported for obese (14.8%) versus overweight (2.0%) and normal-weight (3.8%) respondents ( $p = 0.02$ ).

## Discussion

This study confirmed that obese males and females experience increases in odds of victimization due to two major forms of bullying. In addition, obese females reported increases in relational perpetration. Our findings are congruent with previous cross-sectional studies [1, 6] and confirm that obese children are at risk for social consequences attributable to their

appearance, consistent with Lerner's Theory of Planned Behavior, and the Weight Stigma Approach [2, 7]. These views about obese children may translate into negative attitudes and behaviors towards them.

Our study findings are important as increased involvement in bullying is associated with other forms of interpersonal violence as children grow and develop. Victimization due to bullying can lead to engaging in and being injured from physical fights and weapon carrying for self-defense [8]. Those who do not retaliate directly may still manifest other adverse consequences, including social anxiety or depression [9]. These relationships may have long-term health and social consequences, especially during critical periods of the life course.

Important gender differences were observed in our findings. Boys are much more likely to be bullied physically while girls are more typically involved in relational bullying. This may be attributable to perpetrators targeting that which is important to their peer group, with boys valuing physical dominance over their peers and girls valuing close, intimate relationships. Interventions aimed at such differences have shown mixed receptiveness to anti-bullying interventions by gender, with some studies showing no differences following interventions [10] and others favoring either girls [11] or boys [12]. However, clear differences exist in bullying experiences by gender.

This study has several strengths. First, the study was longitudinal, in contrast to most existing studies which are cross-sectional [1, 6]. Second, past longitudinal research has only been conducted in younger children (ages 7.5–8.5 years) [13] and also older adolescents (ages 15–20 years) [14]. Results from all of these research contexts are consistent. Hence, obese youths may face bullying experiences throughout key developmental periods.

Limitations of this study warrant comment. The sample size available was small, with few incident cases of bullying occurring. This limited our ability to conduct a conventional cohort analysis. The time period under observation was only 1 year and perhaps had insufficient latency to observe effects. The assessment was based on self-report, and while extensive validation work has been performed self-report bias is still an issue. Our findings may therefore underestimate the true association between BMI status and bullying behavior. These limitations may collectively affect the generalizability of the study to other youth populations.

School-based anti-bullying interventions have been shown to be effective overall [10,15], despite gender differences in receptiveness. These interventions have focused on increasing awareness surrounding bullying behaviors, empowering by-

standers, and providing support for victims [11]. Targeting those at particularly high risk for bullying involvement may increase the effectiveness of interventions as well as decreasing negative psychosocial consequences of bullying involvement. Particular focus should be paid to school level interventions, using techniques similar to those combating racism and gender discrimination, in order to reduce the prevalence of weight-based teasing. Stigmatizing behaviors directed towards the obese need to be decreased. The promotion of environments where all body types are accepted is one avenue by which this psychologically damaging behavior can be reduced and potentially eliminated.

## Conclusion

Interpersonal violence can affect the healthy development of children as they transition to adulthood. Our study demonstrates the importance of physical appearance as a determinant of bullying experiences among Canadian youths. This research adds to the growing body of literature that shows that excess adiposity has consequences beyond direct physical health.

## Human Subjects Approval Statement

The Queen's University General Research Ethics Board approved the Canadian HBSC survey protocol. Consent to participate was sought at the school board, school, parental and student levels.

## Acknowledgements

HBSC is a World Health Organization/European Region collaborative study. International Coordinator of the 2005–2006 study: Candace Currie, University of Edinburgh, Scotland; Data Bank Manager: Oddrun Samdal, University of Bergen, Norway. The Canadian data bank manager is Matthew King, Queen's University, Kingston, Ontario, Canada. This publication reports data solely from the province of Ontario in Canada (Principal Investigators: Dr. William Boyce and Dr. William Pickett).

The study was supported by research agreements with the Canadian Institutes of Health Research (operating grant: 2004MOP-CHI-128223-C) and the Public Health Agency of Canada (contract: HT089–05205/001/SS) that funds the Canadian version of the Health Behaviour in School-aged Children survey.

## Disclosure Statement

No conflicts of interest declared.

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